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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/228,772	01/06/1999	JACOB BENESTY	BENESTY21613	8127

7590

03/01/2004

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EXAMINER

SWERDLOW, DANIEL

ART UNIT	PAPER NUMBER
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2644

12

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/228,772

Applicant(s)

BENESTY ET AL.

Examiner

Daniel Swerdlow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-10 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,6,8,10 and 13-16 is/are allowed.
- 6) ☒ Claim(s) 3 and 5 is/are rejected.
- 7) ☒ Claim(s) 7 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 29 December 2003. These drawings are not acceptable. "Replacement Sheet" and "Annotated Marked-up Drawing" identifications must be made in the top margins of the respective sheets. Top margins refer to the top of the sheet as it is filed (i.e., in portrait orientation). The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanemasa (US Patent 4,621,172) in view of Duttweiler (US Patent 5,951,626). Kanemasa discloses an echo canceller including an adaptive digital filter (Fig. 4, reference 20; column 1, lines 33-34) that corresponds to the adaptive filter utilizing a fast converging adaptive algorithm claimed; a correction coefficient generator (column 4, lines 55-65; column 11, lines 2-4; Fig. 4, reference 50, 54, 56, 58, 60, 62, 64) that corresponds to the modifying means claimed for correcting (i.e., modifying) coefficients (i.e., the algorithm) adaptively (column 4, line 60) using a sign bit extractor and hysteresis (i.e., non-linearity) (Fig. 4, reference 50, 64) and weighting (i.e., scaling) (Fig. 4, reference 62; column 5, lines 6-8); and interruption of adaptation during double-talk (i.e., a double talk detector for disabling the adaptive filter in response to double talk) (column 10, lines 30-34) when used for speech transmission (i.e., on a telephone circuit). Therefore, Kanemasa anticipates all elements of Claim 3 except the algorithm being PNLMS. Duttweiler

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discloses use of the PNLMS algorithm (column 1, lines 40-44) in an echo canceller. It would have been obvious to one skilled in the art at the time of the invention to apply the PNLMS algorithm as taught by Duttweiler to the echo canceller taught by Kanemasa for the purpose of providing significantly faster adaptation without sacrificing estimation quality or significantly increasing computational burden (Duttweiler: column 1, lines 44-48).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanemasa in view of Gay (US Patent 5,428,562). Kanemasa discloses an echo canceller including an adaptive digital filter (Fig. 4, reference 20; column 1, lines 33-34) that corresponds to the adaptive filter utilizing a fast converging adaptive algorithm claimed; a correction coefficient generator (column 4, lines 55-65; column 11, lines 2-4; Fig. 4, reference 50, 54, 56, 58, 60, 62, 64) that corresponds to the modifying means claimed for correcting (i.e., modifying) coefficients (i.e., the algorithm) adaptively (column 4, line 60) using a sign bit extractor and hysteresis (i.e., non-linearity) (Fig. 4, reference 50, 64) and weighting (i.e., scaling) (Fig. 4, reference 62; column 5, lines 6-8); and interruption of adaptation during double-talk (i.e., a double talk detector for disabling the adaptive filter in response to double talk) (column 10, lines 30-34) when used for speech transmission (i.e., on a telephone circuit). Therefore, Kanemasa anticipates all elements of Claim 3 except the algorithm being APA. Gay discloses use of the APA algorithm (column 2, lines 54-63). It would have been obvious to one skilled in the art at the time of the invention to apply the APA algorithm as taught by Gay to the echo canceller taught by Kanemasa for the purpose of providing fast convergence with low complexity (Gay: column 1, lines 39-42).

Allowable Subject Matter

5. Claims 4, 6, 8, 10 and 13 through 16 are allowed.

6. The following is an examiner's statement of reasons for allowance: Claims 13 through 16 are allowable for reasons stated in the prior Office action mailed on 8 August 2003, paper no. 8.

7. Claims 4 and 6 are rewritten in independent form including all limitations of the base claim and any intervening claims and are allowable for reasons stated in the prior Office action.

8. Claims 8 and 10 are allowable due to dependence from Claims 4 and 6 respectively.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

9. Claims 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claim 7 claims the filter of Claim 3 wherein the adaptive scaled nonlinearity is given by: $\Psi(|e_n|/s)\text{sign}\{e_n\}s_n$. As stated above apropos of Claim 3, the combination of Kanemasa and Duttweiler makes obvious all elements of that claim. However, the particular formula for the adaptive scaled nonlinearity claimed is neither anticipated nor made obvious by the prior art. Therefore, Claim 7 is allowable matter.

11. Claim 9 claims the filter of Claim 5 wherein the adaptive scaled nonlinearity is given by: $\Psi(|e_n|/s)\text{sign}\{e_n\}s_n$. As stated above apropos of Claim 5, the combination of Kanemasa and Gay

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makes obvious all elements of that claim. However, the particular formula for the adaptive scaled nonlinearity claimed is neither anticipated nor made obvious by the prior art. Therefore, Claim 9 is allowable matter.

Response to Arguments

12. Applicant's arguments filed 29 December 2003 have been fully considered but they are not persuasive.

13. Regarding Claim 3, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

14. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Kanemasa and Duttweiler are directed to solving the problem of echo cancellation using adaptive filtering. Kanemasa teaches the use of scaled non-linearity in processing the error signal in order to improve operation of the adaptive filter in the echo canceller. Duttweiler teaches that the PNLMS algorithm is advantageous in an echo canceller, imparting improved convergence speed. As such, one skilled in the art at the time of the

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invention would have been motivated to utilize the advantageous PNLMS algorithm taught by Duttweiler in the adaptive digital filter of the echo canceller taught by Kanemasa.

15. Regarding Claim 5, in response to applicant's arguments against the references individually, as stated above, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

16. In response to applicant's argument that there is no suggestion to combine the references, as stated above, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In this case, both Kanemasa and Gay are directed to solving the problem of echo cancellation using adaptive filtering. Kanemasa teaches the use of scaled non-linearity in processing the error signal in order to improve operation of the adaptive filter in the echo canceller. Gay teaches that the APA algorithm is advantageous in an echo canceller, providing fast convergence with low complexity. As such, one skilled in the art at the time of the invention would have been motivated to utilize the advantageous APA algorithm taught by Gay in the adaptive digital filter of the echo canceller taught by Kanemasa.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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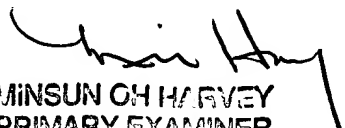
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 703-305-4088. The examiner can normally be reached on Monday through Friday between 8:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forrester Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ds



MINSUN OH HARVEY
PRIMARY EXAMINER